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PROGRESS

of the

Barberry Eradication Campaign

in

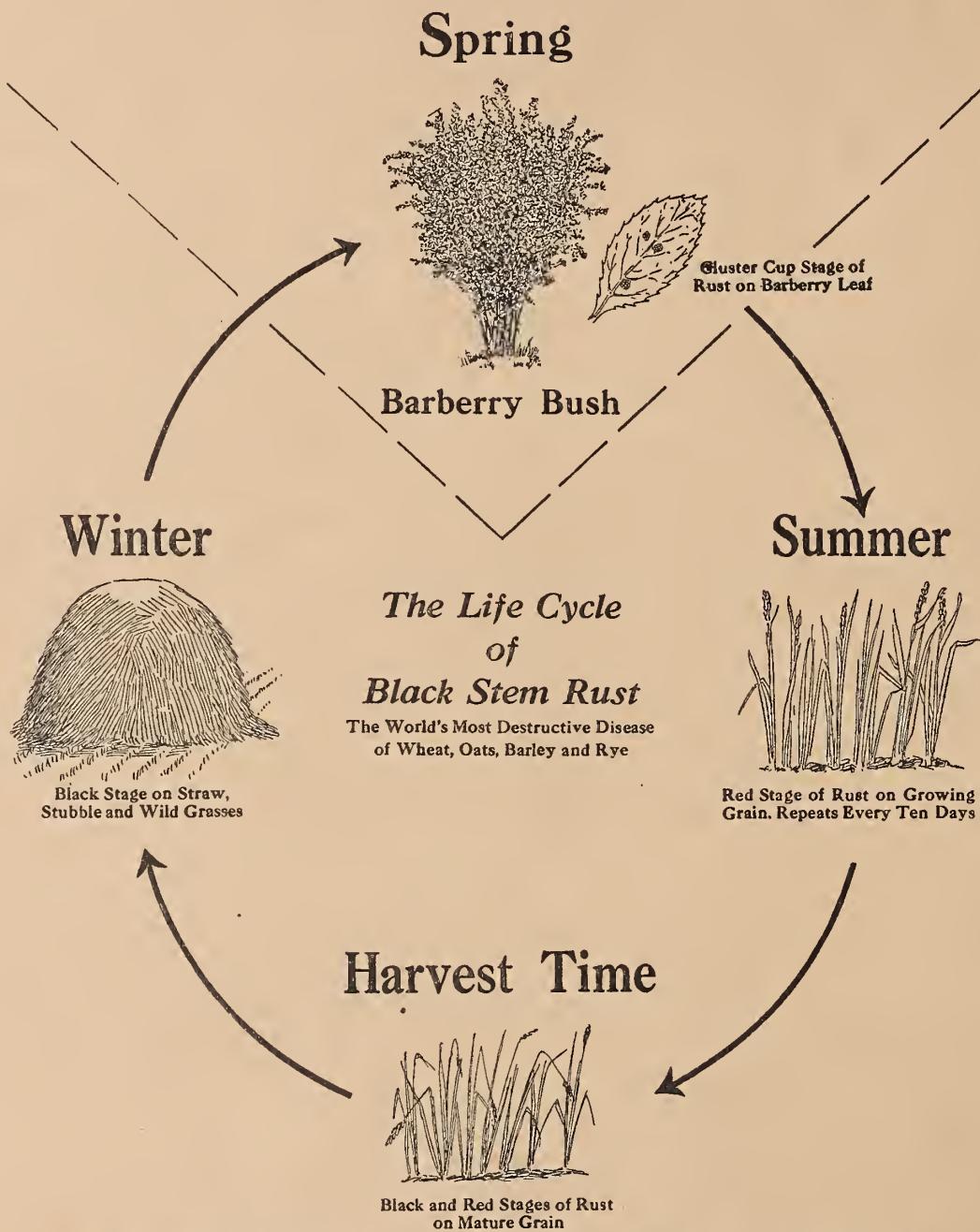
MINNESOTA in 1929



Our Grain Crops Must Be Protected from Black Stem Rust

Barberry Eradication Pays

Remove the Barberry and Break the Rust Cycle



All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

BOOST BARBERRY ERADICATION—A PRACTICAL RUST
CONTROL MEASURE

PROGRESS OF THE BARBERRY-ERADICATION CAMPAIGN

IN MINNESOTA, 1929

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Office of Barberry Eradication,^{2/} Bureau of Plant Industry,

United States Department of Agriculture

Introduction

The eradication of common barberry is both a relief measure and a preventive one in its relation to the spread of black stem rust. If common barberry bushes were allowed to grow unhindered, producing seeds and multiplying, they soon would become so numerous and destructive that small grains (including wheat, barley, rye, and oats) would be attacked nearly every year by severe stem-rust epidemics. It is interesting to note that since 1918, 860,849 common barberry bushes and seedlings and 52,362 sprouting bushes have been found and destroyed in Minnesota. A large proportion of these bushes have been producing seeds. Therefore, barberry eradication has prevented millions of seeds from being spread by birds and other agencies.

The eradication of this large number of common barberry bushes has meant the elimination of many stem-rust spreading centers. It seems reasonable, therefore, that there should be some reduction in the losses caused by stem rust. From 1915 to 1921, inclusive, the average annual loss to wheat from stem rust in Minnesota was more than 9,000,000 bushels. From 1922 to 1929, inclusive, the average annual loss to wheat was approximately 3,000,000 bushels. The reduction of losses of approximately 6,000,000 bushels annually during the last eight years represents a real decrease in losses due to control measures. The eradication of common barberry undoubtedly has aided in this reduction of losses to wheat from black stem rust.

Survey and Eradication Activities

In 1929 survey activities were concentrated on the second survey of Carver and Scott Counties and the rural districts of Hennepin County. The first or preliminary survey of these counties had been completed some years before. The first survey was made rapidly in order to destroy the greatest number of bushes in the shortest time, and to cut down seed production, thereby reducing the possibility of further spread of this undesirable shrub.

^{1/} State Leader of barberry eradication in Minnesota.

^{2/} From the beginning of the campaign in 1918 until January 1, 1930, barberry eradication was a project of the Office of Cereal Crops and Diseases, of the Bureau of Plant Industry. On January 1, 1930, the Office of Barberry Eradication was established as a separate unit of the Bureau.

The second survey is more intensive than the first. On this survey a search is made of every foot of every property on which barberry bushes may be growing. The field agents on second survey locate not only the straggling bushes missed on the first survey, but also the new bushes which have grown from seeds scattered by birds and other agencies.

To find every common barberry bush even on second survey is extremely difficult. It must be remembered that birds and other agencies spread seeds and that these seeds may lie in the soil for several years before germinating. These conditions necessitate several thorough inspections of the localities where barberry bushes previously have been destroyed.

The second survey of Carver and Hennepin Counties was started in 1928 and was completed this year. Hennepin County was very difficult to survey because of its numerous lakes and unpastured wood lots. Scott County was the only county in which the second survey was started in 1929.

The necessity of searching for common barberry in every place where a shrub can grow was clearly demonstrated this year. It was not uncommon to search through a wood lot of more than 100 acres and find but one barberry bush. On several occasions an immediate recheck of this wood lot would fail to reveal additional bushes. If the one bush had been allowed to remain the many seeds produced by it would have further complicated the problem of eradication. In fact, eventually it would have resulted in the whole wood lot being infested with bushes, which, under favorable conditions, could spread an enormous amount of stem rust.

The problem of locating escaped bushes grown from seed scattered by birds and other agencies obviously complicated the Minnesota survey in 1929. Birds that like to live near water seem to be fond of barberries. It is not uncommon to find areas of escaped bushes developing along lake shores where these birds roost. The favorite roosting places for birds that eat barberries seem to be large wide-spreading trees, whether they be oak, cottonwood, maple, elm, or pine. It is under these types of trees that many escaped common barberry bushes are found.

Fence rows furnish a good place for barberry bushes to gain a start. In cut-over wood lots, where large numbers of seed were scattered by birds before the trees were cut, common barberry bushes seem to develop rapidly when once the native vegetation is removed.

To give an idea of the number of bushes found, the following table is included in this report:

County	No. townships surveyed	New properties having bushes	Planted bushes	Escaped bushes	Seedlings	Sprouting bushes	Total, all bushes and seedlings
Carver	6	8	2	46	2,000	0	2,048
Hennepin	16	71	248	209	486	22	965
Scott	7	18	34	66	60	11	171
TOTAL	29	97	284	321	2,546	33	3,184

BLACK STEM RUST SPREADS FROM COMMON BARBERRIES



to Wheat, Oats, Barley, Rye and other Grasses.

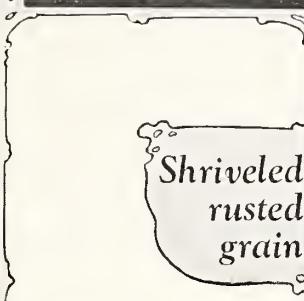
Black Stem Rust as it appears on the leaves of the Common Barberry



Enlarged single leaf



Plump healthy grain



Shriveled rusted grain



DANGEROUS NEIGHBORS



Common Barberry Bushes growing near grain fields

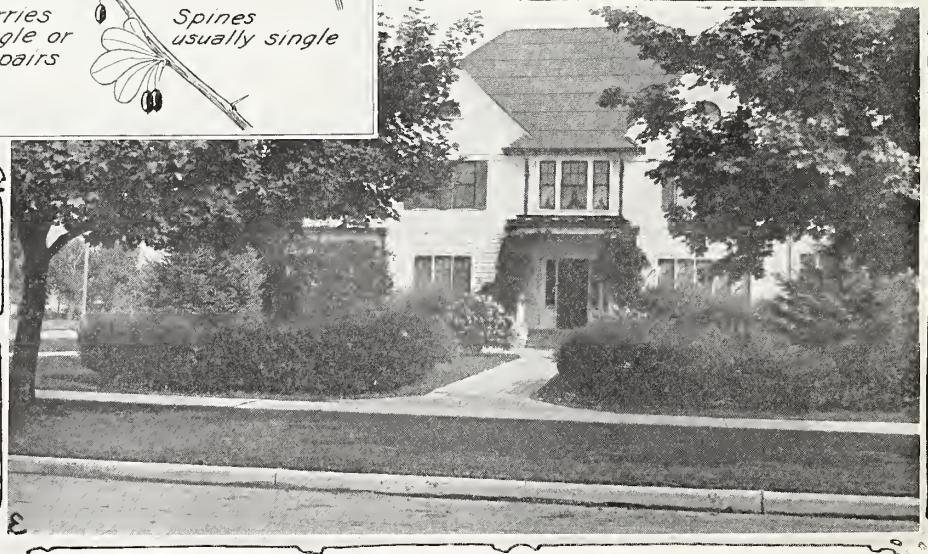
Report Common Barberry bushes you may find to your State Leader of Barberry Eradication.



Common Barberry is
harmful, destroy



Japanese Barberry is harmless,
do not destroy



Common barberry distributed over 97 different locations in three counties can spread a large amount of stem rust. The 321 escaped bushes and 2,546 seedlings found growing on these properties show clearly the necessity for a careful intensive survey.

Eradication

Common barberry is eradicated easily if the proper methods are used. Most of the bushes are killed by applying a layer of common salt over the base, or crown. There is no necessity for cutting the bushes, as they die more rapidly if the canes are allowed to remain standing.

Bushes growing in gardens or near valuable trees necessarily must be dug, and in such cases it is necessary to get every root no matter how small, to prevent the development of sprouts. Under no circumstances should an attempt be made to kill barberry bushes by cutting them. This procedure stimulates root growth and seldom kills the plants.

In case common barberry bushes are found, it will be appreciated if they are reported to the Barberry Eradication Office, University Farm, St. Paul, Minn. This cooperation is necessary because additional bushes often develop from seeds previously scattered. For this reason repeated inspections are made of these places to get rid of the bushes that have developed since the last survey.

Stem-Rust Observations

Each year an effort is made to find out where barberry bushes are spreading black stem rust. One of the best methods is to study stem-rust conditions near common barberry bushes as a part of the summer program. In nearly every instance it is easy to trace the spread of stem rust to wild grasses from common barberry bushes, provided they are infected with the rust. In many cases the rust spreads again from the wild grasses to grain fields. It is not uncommon to trace the spread of stem rust from barberry to grasses and thence on grasses for more than one-half mile to grain fields. Wild barley is one of the most common wild grasses which carries the wheat strain of stem rust. Occasionally common barberry is found immediately adjacent to grain fields. In such cases there usually is much more stem rust near the barberry bushes than at the other edge of the field.

All Known Methods of Rust Control Must Be Employed

While barberry eradication is of first importance, there are several known methods for reducing losses due to black stem rust. Early sowing of grain, proper preparation of the seed bed, avoidance of low, poorly drained land, proper use of fertilizers, in fact, anything that promotes early ripening of the grain, will help to reduce the danger from rust.

Certain varieties of wheat, oats, and barley that are more disease-resistant than others have been produced by plant breeders. Wherever these varieties meet the requirements of a given region and are desirable from the standpoints of yield, milling quality, and resistance to other cereal diseases, they should be substituted for the less satisfactory varieties.

New Strains of Destructive Black Stem Rust

Develop on the Common Barberry

The production of rust-resistant varieties of grains probably will be much more successful when all common barberry bushes have been eradicated. The reason for this is shown in the recent important discoveries made in the Canadian Rust Research Laboratories at Winnipeg and by E. C. Stakman and his coworkers at the University of Minnesota. Both of these groups, conducting independent research, have proved that entirely new strains of black stem rust are produced if two different forms of the rust crossbreed on barberry leaves. The certainty that new forms of the dangerous disease may appear suddenly, makes the eradication of the common barberry all the more imperative, since it is on the barberry alone that this crossing can occur. The new and apparently resistant varieties of grains are not safe with barberries near. If for no other reason than to protect the new kinds of superwheat that are now in the process of being developed, all common barberry bushes should be destroyed.

Educational Activities

One of the principal features of the educational activities in Minnesota in 1929 was the cooperation of the children of grade-school age. In talks and demonstrations given before 4-H Club camps, county fairs, and teachers' institutes, an offer was made to present an attractive medal to each boy or girl reporting the location of barberry bushes. This medal was given by the Conference for Prevention of Grain Rust of Minneapolis. Upon receipt of a medal the boy or girl having reported the bushes automatically became a member of the "National Rust Busters' Club." A great deal of interest was shown by school children in the campaign following this activity.

During the winter months a contest was conducted with Minnesota school teachers, the purpose of which was to obtain the most suitable teaching plan possible for presenting to pupils of junior high schools the subject of stem-rust control. The offer of \$100 in cash by the St. Paul Dispatch-Pioneer Press for the best teaching plan submitted by a Minnesota teacher aided tremendously in creating interest in the contest. This contest was being conducted in each of the 13 barberry-eradication States. The teaching plans winning first, second, and third places in Minnesota were entered in the National contest to compete with similar plans from other States. The winner of first place in Minnesota received second place in the National contest sponsored by the Conference for Prevention of Grain Rust. Many excellent plans for presenting the subject



FLOWERS
(yellow)



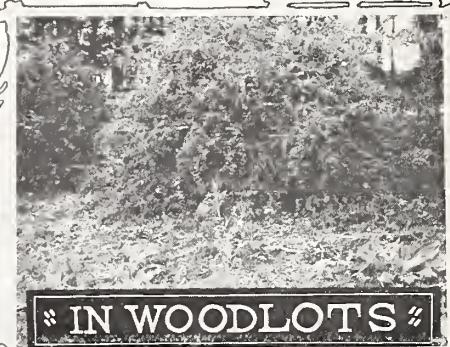
"IN DOORYARDS"

BERRIES
(bright red)

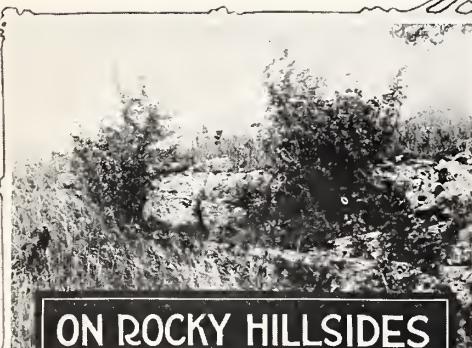
Where Barberry Bushes Grow



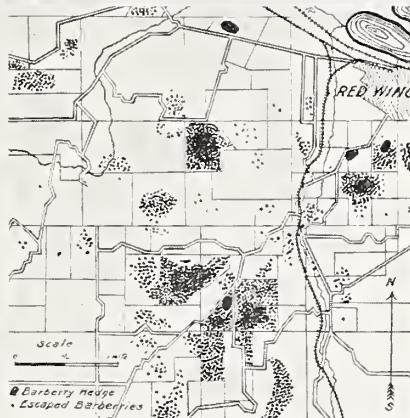
BIRDS CARRY BARBERRY SEEDS SEVERAL
MILES, DROPPING THEM AMONG ROCKS
AND IN OUT-OF-THE-WAY PLACES



"IN WOODLOTS"



ON ROCKY HILLSIDES



AS HEDGE FENCES

Barberries spread by birds



"UNDER OTHER"
SHRUBS AND TREES





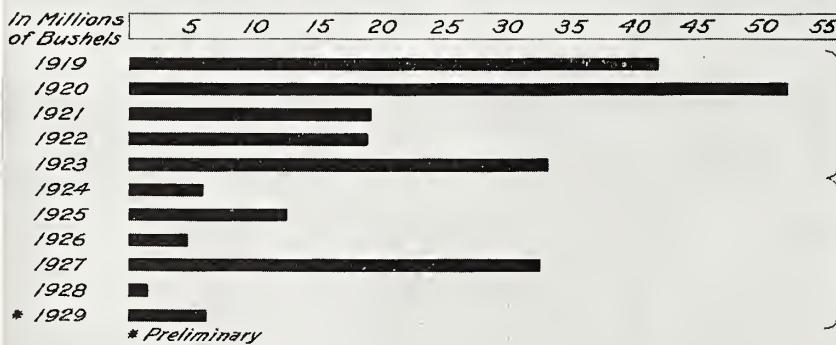
Salting a bush



Sprouts from a dug bush

Common Salt Kills Barberry Bushes and Prevents Sprouting

Wheat Losses in Barberry Eradication Area, 1919-1929



The average annual loss for the first five year period, 1919 to 1923, was approximately 33,000,000 bushels.

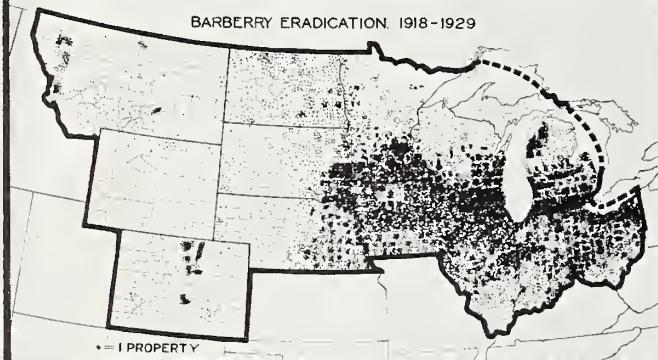
The average annual loss for the next six year period, 1924 to 1929, was approximately 10,500,000 bushels.

The losses to small grain crops caused by black stem rust have been reduced since the beginning of the barberry eradication campaign in 1918. The breeding of rust-resistant varieties, the use of early maturing varieties, and the sowing of crops early, have aided barberry eradication in this reduction.

"BARBERRY ERADICATION PAYS"

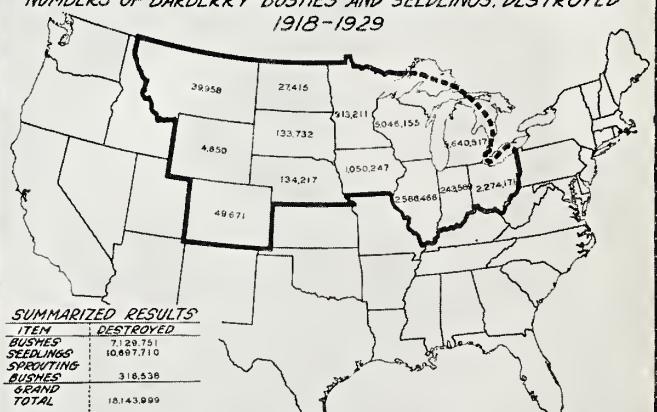
RURAL PROPERTIES ON WHICH BARBERRY BUSHES WERE FOUND-ALL SURVEYS

BARBERRY ERADICATION, 1918-1929



Prepared by the Rust Prevention Association, 300 Lewis Building, Minneapolis, Minn., in co-operation with Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.

NUMBERS OF BARBERRY BUSHES AND SEEDLINGS, DESTROYED 1918-1929



of black stem rust control to pupils of the grade schools were received from teachers throughout the barberry-eradication area.

Publicity Activities

The fine cooperation of the newspapers and other press agencies in Minnesota has aided the barberry-eradication campaign in its survey and educational activities. The field agents find the search for common barberry much easier when the people in a county have been informed that a survey is to be made. In many instances property owners await the arrival of the field agents so that they may learn to identify certain shrubs growing on their properties which they think may be common barberry.

These people learn about the barberry and its relation to black stem rust from their newspapers and magazines and from other sources, such as circular letters sent by the State Leader to all rural mail boxes.

Cooperation

The United States Department of Agriculture, through its Office of Barberry Eradication in the Bureau of Plant Industry, is doing its utmost to find and destroy all the common barberry bushes in Minnesota. The Conference for Prevention of Grain Rust of Minneapolis is giving excellent assistance in educational and publicity work. The State Department of Agriculture, through its weed inspectors, and the University of Minnesota, through its Extension and Plant Pathology Divisions, also give valuable aid to the campaign.

Future Problems

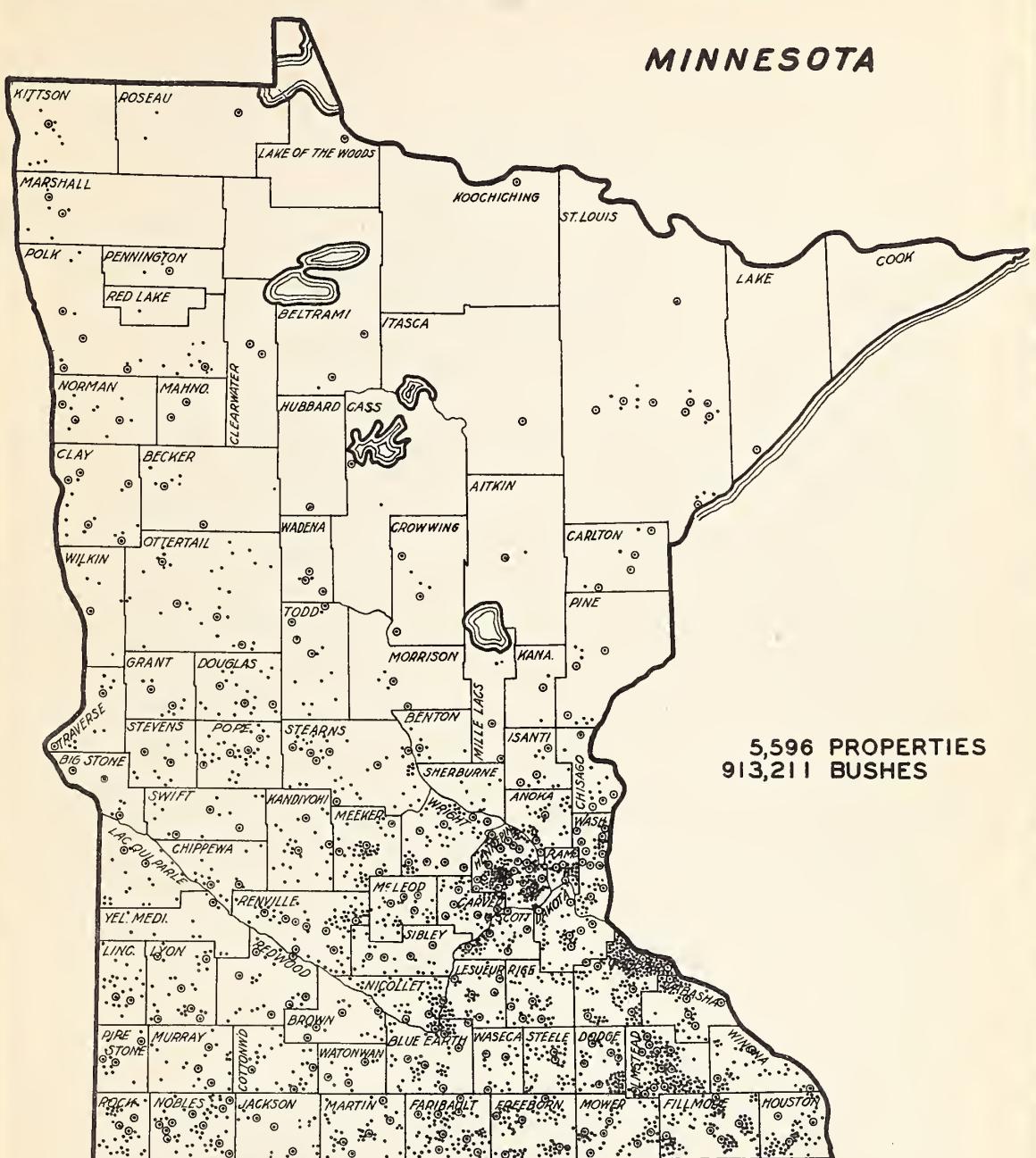
Unquestionably the immediate problem is to complete the intensive survey of southeastern Minnesota, where escaped barberry bushes are common. It is logical to make every effort possible to remove these bushes before further spread occurs.

Another problem which must be faced is that of checking localities for barberry seedlings where old barberry bushes have been destroyed during the intensive survey. Checks of this kind are necessary at least once in five years. If this is not done all original efforts to get rid of the barberry bushes will have been wasted.

Past experience has demonstrated that barberries, developing from seeds spread by various agencies, are constantly being produced. These bushes are capable of spreading an enormous amount of stem rust to grains; therefore, the finding and destroying of common barberry bushes is a necessary crop-sanitation measure to prevent future severe local epidemics of black stem rust.

PROPERTIES HAVING BARBERRY BUSHES 1918-1929

MINNESOTA

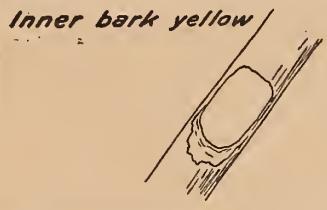
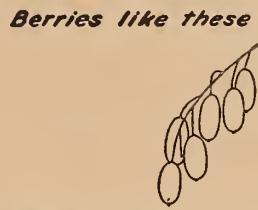
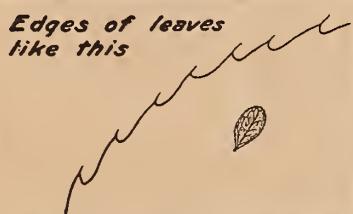


- FARMS HAVING BARBERRY BUSHES
- TOWNS HAVING BARBERRY BUSHES

10. *Leucosia* *leucostoma* *leucostoma* *leucostoma* *leucostoma* *leucostoma*

Common Barberry Spreads Black Stem Rust

When you find
a spiny bush
with-

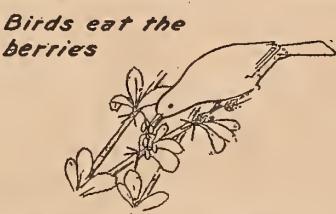


It is a
Common Barberry
and should be
reported at once

Know Common Barberry

Look For It!

Spread of
Barberries by
birds



From which seedling
bushes grow



They in time
bear fruit which
is again carried
farther on

Look For and Report All Common Barberry Bushes

To the State Leader of Barberry Eradication, in care of your State Department of Agriculture or your State Agricultural College.

Common Barberry Bushes

spread

Black Stem Rust

to

**WHEAT, OATS,
BARLEY, RYE,
*and Many Wild
Grasses***

THIS Progress Report is prepared and printed by the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. The cover is furnished by the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minnesota.